A Baker’s Dozen Worst Weeds Invading the Estes Valley

Identification

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Revised Edition © 2012

Weeds don’t wait until we’re ready for them! This guide is a work in progress (version 1.2) for this general area, provided for summer 2012 because people have been asking for help to identify invasive plants in the Estes Valley. A first edition (version 1.0) was published in July 2011.

Tim D’Amato of the Larimer County Weed District provided substantial early assistance with some draft possibilities and excerpts from their publications, which I used as starting points in researching, developing and writing the text. The drawings were selected from other sources made generally available to the public and nearly all are in the public domain. All drawings except Sonya Reasor’s have been adapted (and are sometimes variously combined) for this guide. Consequently, the artists are recognized by the following.

The artists are unknown for some of the original drawings, and efforts to determine them continue. N.L. Britton and A. Brown did not name the artists who contributed to their *Illustrated Flora* (1913). The original drawing (©) of *Centaurea ×psammogena* is from Jörg Ochsmann (1997). Sonya Reasor provided her drawing (©) of *Euphorbia myrsinites* (in the center). Drawings by these other artists have been identified: Ferdinand Bauer; Agnes Chase; Hippolyte Coste; Walter Hood Fitch; Ken Frost; Regina O. Hughes; Yi-Li Keng; W.H. Lindemann; C.A.M. Lindman; Amédée Masclef; F. Schuyler Mathews; Dennis Morris; Matilda Smith; Isaac Sprague; Jacob Sturm; Otto Wilhelm Thomé; Karl Urban; Elly Waterman; Frank M. Wheat.

The author welcomes suggestions from your use of this 2012 edition. Some participants in the Estes Land Stewardship Association commented on earlier drafts of a related text. All these contributions from the past publications, research and experience of others are much appreciated, as your suggestions will be. We benefit from the knowledge and efforts of many — and our combined forces can help to keep these invaders in check!

Introduction

This identification guide addresses a baker's dozen (13) local weeds, non-native plants invasive in the Estes Valley. This guide will help you learn to recognize them. Participants in a meeting of the Estes Land Stewardship Association (ELSA) in fall 2010 came up with "The Top Ten" invasives here, those weeds considered the most troublesome and in need of earnest attention. They grouped the two knapweed species (not mentioning the hybrid) and did not mention Japanese brome grass. This "Baker's Dozen" of invasive plants is recognized by the botanical names within ELSA's priority list:

❶ **Diffuse knapweed, European hybrid knapweed, and Spotted knapweed**
– Sunflower family
Centaurea diffusa, *Centaurea ×psammogena*, and
Centaurea stoebe ("*Centaurea maculosa*, *Centaurea biebersteinii*")

❷ **Hoary alyssum** – Mustard family
Berteroa incana

❸ **Canada thistle** – Sunflower family
Cirsium arvense (*Breea arvensis*)

❹ **Cheatgrass** – Grass family
Bromus tectorum and *Bromus japonicus*

❺ **Dalmatian toadflax** – Speedwell family (Snapdragon tribe)
Linaria dalmatica (*Linaria genistifolia* subsp. *dalmatica*)

❻ **Musk thistle** – Sunflower family
Carduus nutans

❼ **Yellow toadflax** – Speedwell family (Snapdragon tribe)
Linaria vulgaris

❽ **Myrtle spurge** – Rubber-tree family
Euphorbia myrsinites

❾ **Houndstongue** – Forget-me-not family
Cynoglossum officinale

❿ **Leafy spurge** – Rubber-tree family
Euphorbia esula

Legal Status

With each species account below is also given the management category the weed has been officially placed in under Colorado's noxious weed law: **List A**, the species to be eradicated from Colorado, as well as a high alert and early warning of several extremely noxious species infesting other regions to prevent them from getting a start in Colorado; **List B**, species the State develops and carries out individual management plans against to prevent their spread; **List C**, species for which the State develops and carries out targeted plans to assist in the management efforts of requesting local governing entities. The level of mandated control of List B and List C species is based on local conditions. Private landowners may be required to undertake control efforts, so ask questions, and check with your local authorities (see Larimer County and Boulder County websites indicated at the back). Almost all these featured species are on List B. Myrtle spurge is on List A; downy brome cheatgrass is on List C.

Easy Ways to Identify and Remember the Invaders

The weedy plants featured here are organized to make it easy to learn and remember them. Their priority ranking is given in the descriptive account for each species, which follows this overview. Technical words are kept at an absolute minimum in the descriptions, which instead use more familiar characterizations. *First, just glance through and look at the pictures; then come back and go through this section, before reading the individual species accounts*. Find these plants outside, and explore the websites indicated at the back, which have color photographs. An electronic copy of this publication can be downloaded from the ELSA website.

Common Names

To simplifly learning these invasive plants, take advantage of their common names, which can even be categorized. They often came about from people noticing something distinctive or characteristic about the plant's own look or a resemblance, or its behavior, or how likely it is to be found in an area. Some names reflect our attitude toward the plant. Sometimes less helpful are the names based on where the plant came from as a native or where it somehow came to people's attention. So, many common names of our invaders are like nicknames.

The descriptive common names for these invaders include: butter-and-eggs, hound's tongue, donkey's-tail spurge, diffuse knapweed, leafy spurge, downy brome, hoary allysum, broadleaf toadflax, spotted knapweed, nodding thistle, creeping thistle, creeping spurge, gypsy flower, musk thistle, and common toadflax. The biologist Carl Linnaeus in 1753 named *Euphorbia myrsinites* — myrtle spurge — because of a resemblance to their cultivated common myrtle, a similarity Theophrastus noted in Greece as long ago as roughly 300 B.C. Toadflax suggests a plant with narrow leaves like cultivated flax, and flowers resembling the mouth of a toad with its tongue starting to shoot out to catch something good to eat. Diffuse knapweed scatters its seeds by becoming a tumbleweed, its diffuse branching having made it a ball that rolls with the wind.

Common names that relate these weedy invaders to people include cheatgrass (originally from cheating the farmer of wheat, but now it is also cheating our native plants of home — with far-reaching consequences), Japanese brome, Canada thistle, European hybrid knapweed, and Dalmatian toadflax. European hybrid knapweed suggests hybrids originating in Europe, since one of its crossing parents was not introduced here. A few of the usual common names are even misleading. Yellow toadflax tends to present contrastingly two-toned flowers (yellow to pale yellow to whitish, plus darker yellow to orangish), whereas Dalmatian toadflax generally has flowers that are just uniformly bright yellow, or less contrasting. Canada thistle is native to the Old World, and as much a troublesome weed in Canada as here; the better name creeping thistle is used in Europe where it has been familiar for centuries, but infrequently in North America.

Family Kinship and Flower Color

The invasive plants covered in this booklet are in only six botanical families, and four of these have more than a single species represented here. A glance at the priority list provides a symbol to easily learn and recall which of these just six groups the species is in. In the individual descriptive accounts below, the invading species are organized by their family, and by flower colors. Think of these families like suits in a deck of cards, like hearts (♥), diamonds (♦), clubs (♣) and spades (♠). When you start classifying the plants in this way, their familial resemblance makes the vastly diverse world of flowering plants become more approachable.

You already know one of these botanical families, the Grass family (⇞); cheatgrass is placed as the final account, so all the weedy plants with showy flowers come first. You may also recognize the thistles and their kin (Cardueae tribe) (❂) in the Sunflower family. All of these invaders have flowerheads that are purplish, lavender, pinkish or white, or each flowerhead is two-colored — lavender and white. Nodding thistle (musk thistle) is discussed first because it quickly becomes easy to recognize, and it is also less daunting to control than the next species, the truly infamous creeping thistle (Canada thistle) which has distinctively smaller clustered flowerheads. The thistle-like knapweeds are the worst of the bunch as invasives here, but don't have spiny leaves like the actual thistles, and are placed last in the tribe because of their detailed complexity. So now we've already got a handle on four of the top ten invaders on the priority list.

The next two accounts describe our other featured invasive species with flower colors (but not shapes) similar to those in the Thistle tribe, either having reddish purple flowers (❀) or white flowers (✤); each of these two species is the sole representative of a botanical family. Over half the invaders now are "put in their place", and only two families to go! The final four invaders are grouped in pairs — the two families each with a close pair of species. The Snapdragon tribe (✿) of the Speedwell family is represented by two species of toadflax having flowers that are entirely bright to pale yellow or are two-toned — each yellow (even whitish) flower also having a dark yellow to orangish spot. The remaining family (❦) with invaders to purge has two spurges with greenish yellow or yellowish green flower-clusters.

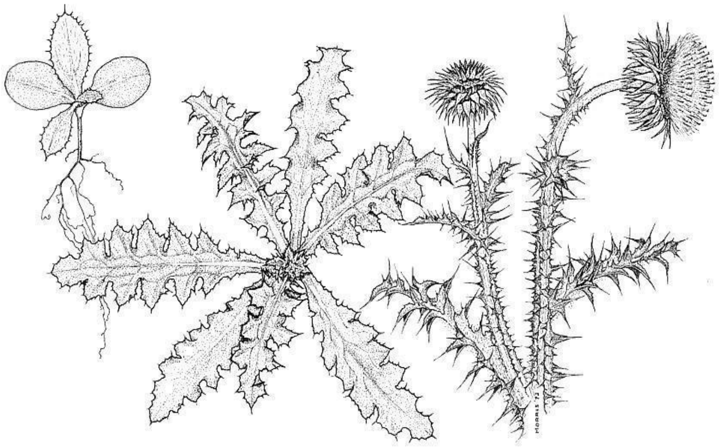
Poisonous or Ready Hitchhikers

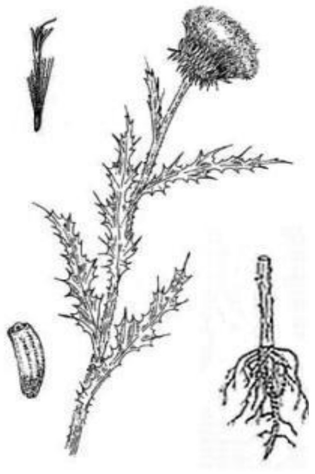
An additional way to help in learning and increasing your attention to remember these invaders, is by how physically dangerous or irritating they are to us or our livestock and pets, or elk, deer and other wildlife. Most of these noxious weeds are armed. The poisonous or toxic plants (◈) are leafy spurge, myrtle spurge, houndstongue and hoary allysum. The plants with stout spines are the thistles and their kin diffuse knapweed and European hybrid knapweed. Additionally, in close encounters sharply pointed cheatgrass fruits can prick the skin as they take a ride on clothing or fur, and cause punctures if eaten by livestock. Houndstongue is doubly armed, also having short-barbed fruits and thus catching like Velcro onto clothing or animal hair or fur to take a ride (sometimes it is called gypsy-flower because it readily travels). So, if you've gone through a patch of these two hitchhikers, plan to deal with what they've done to you (and your pet) — but don't let the weed win by disposing of the extricated seeds where they can germinate and spread the invasion.

Musk Thistle (*Carduus nutans*) ❻ **B**

Sunflower Family (Asteraceae or Compositae)

Also called **nodding thistle**, a trait which makes it easy to recognize. Several of the many subspecies recognized in Europe have been suggested as occurring in North America (e.g., *Carduus nutans* ssp. *nutans*, ssp. *leiophyllus*, and ssp. *macrocephalus*). However the plants here are usually considered too variable for such distinctions, likely because of continuing dispersal and mixing after multiple accidental introductions.

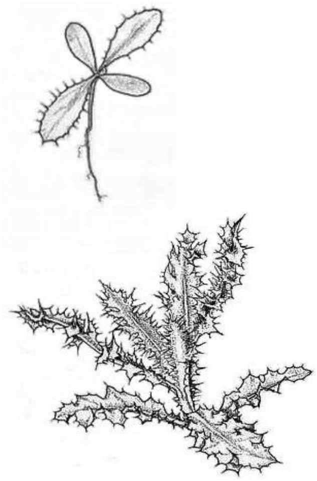


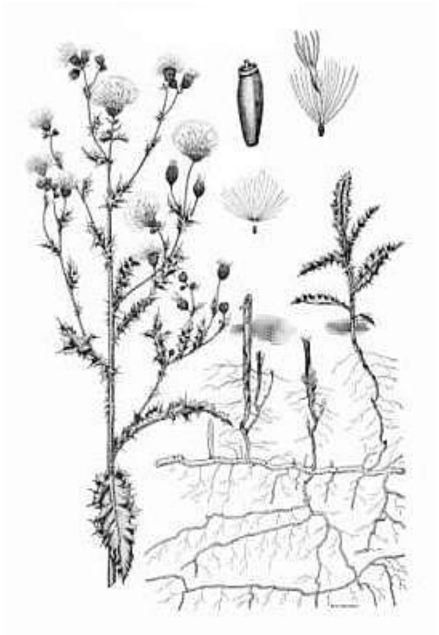


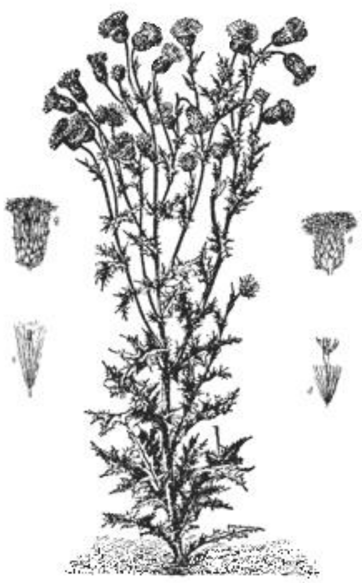
This taprooted biennial (or occasionally annual) reproduces only by seeds. Germination occurs in early spring, or in late summer and early fall. The newly emerged plant over-winters as a rather flat large rosette of whorled leaves (which is 1-2 to even 3 feet wide). In the following year the plant bolts (grows one or a few stout branched stems) and flowers in spring to summer, then dies. The plants grow 2-4 to 6-8 feet tall, with spiny winged stems and spiny generally hairless leaves, which are lobed, wavy, with a prominent light-green midrib and often frosty-looking margin. The large, rose to purplish (or rarely white) flowerheads have pinecone-like spine-tipped bracts and usually appear singly, typically nodding at the end of a longish, typically smooth stalk. The flowers may have a musky fragrance. Seeds are produced from mid-summer into fall, each with a long tuft of many whitish hair-like bristles, which soon detaches. Most seeds fall nearby, but about 5% are well-dispersed by the wind. Seed longevity is variable but seeds can remain viable in the soil for 10-15 years or longer.

Canada Thistle (*Cirsium arvense* or *Breea arvensis*) ❸ B

Sunflower Family (Asteraceae or Compositae)







This invader is sometimes, and better, called **creeping thistle**. The species is a perennial that reproduces by seeds but especially by many deep-seated, creeping lateral roots (which can extend up to 12 feet); as much as 75% of the plant may be underground. In early spring shoots appear above ground as rosettes of clustered leaves, which soon produce a usually branched, non-spiny ridged stalk 1½ to 3-4 feet high. The wavy to lobed leaves have crinkled margins edged with many spines. Many pinkish purple (but sometimes white) small flowerheads (with smooth bracts) occur from spring through summer grouped at the end of upper branches. Most plants have flowerheads with only female flowers (left inset) or only male flowers (right inset). Seeds are produced in late summer, each with a feathery tuft which tends to soon detach, so the seeds are dispersed mostly nearby but some can be blown far away. The seeds usually are not viable in the soil after 3 years, but can remain viable up to 21 years. The flowering stems die back after producing the seeds.

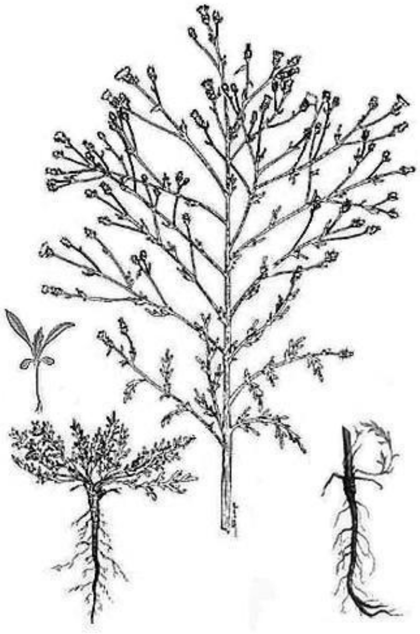
Diffuse Knapweed (*Centaurea diffusa*) and European Hybrid Knapweed (*Centaurea ×psammogena*) ❶

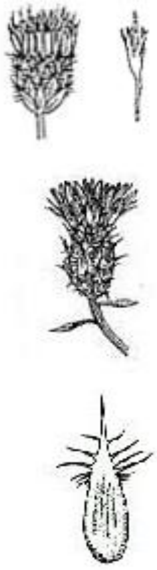
Spotted Knapweed (*Centaurea stoebe* subsp. *micranthos*) ❶

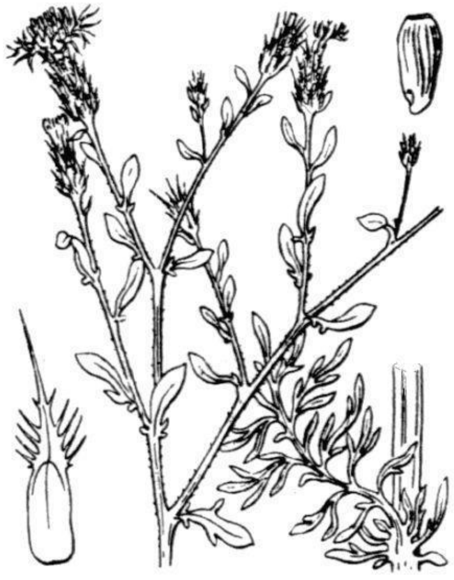
Sunflower Family (Asteraceae or Compositae)

Generally diffuse knapweed (**B**) and European hybrid knapweed occur together, and the plants at a site have a mixed range of characteristics. This is the worst invasive in the Estes Valley. Spotted knapweed (**B**) does not cross with them, but intermediates look like they did. The spotted knapweed invading North America has also been called *Centaurea stoebe* subsp. *australis*, *Centaurea maculosa* and *Centaurea biebersteinii*, but the right scientific name is still unsettled in Europe and so for the plants that got over here. (Occasionally these species have been called *Acosta diffusa* and *Acosta maculosa* or *Acosta biebersteinii*.)

These introduced species and hybrid reproduce only or mostly by seeds, which can remain viable in the soil up to 15 years. Diffuse, European hybrid, and spotted knapweeds are all prolific seed producers and can spread rapidly. These knapweeds prefer light well-drained soils, and diffuse knapweed does not require as much moisture.

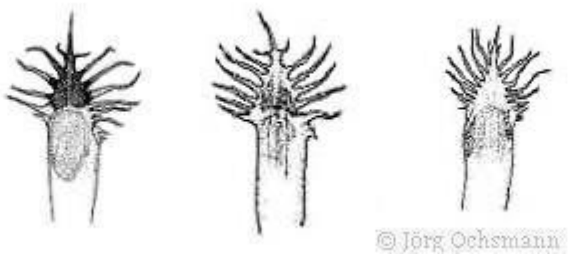






Diffuse knapweed (2n) is primarily a biennial (or sometimes annual or triennial) that germinates in the first summer to fall and over-winters as a taprooted low rosette of whorled leaves. Plants in their second spring to summer grow ½ to 2 feet high, with full diffuse branching, finely divided leaves, and thistle-like smallish flowerheads. Below the flowerhead’s usually white (but sometimes pale pink) flowers are greenish-golden bracts; a bract’s upper portion has several spines on each side and an outward-pointing longer terminal spine. By late summer, seeds have been produced and the plants begin to dry up. By winter the plants break off at the base and become tumbleweeds, which helps to disperse the seeds. The seeds are not tufted at one end (or sometimes scarcely so).

European hybrid knapweed (2n) looks mixed or intermediate between diffuse knapweed and spotted knapweed, because it originated in Europe from natural crosses of *Centaurea diffusa* and *Centaurea stoebe* subsp. *stoebe* (2n), a subspecies not definitely found in North America. Each flowerhead of hybrids often has white central flowers (florets) and lavender to purple outer florets. Often the flowerhead's bracts have a typically dark tip and a terminal spine, but bracts may have a weaker black spot and shorter terminal spine, or no terminal spine but no black spot.



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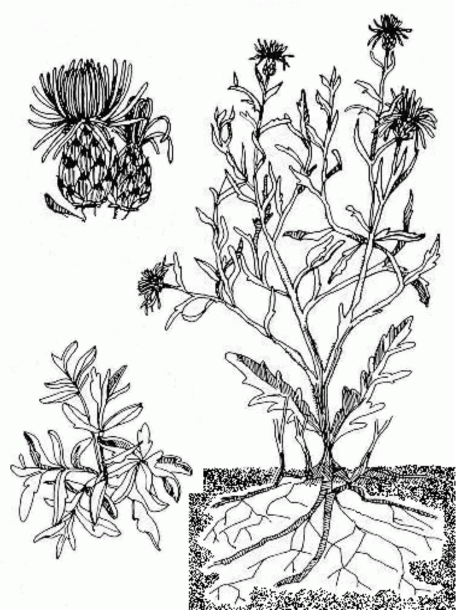
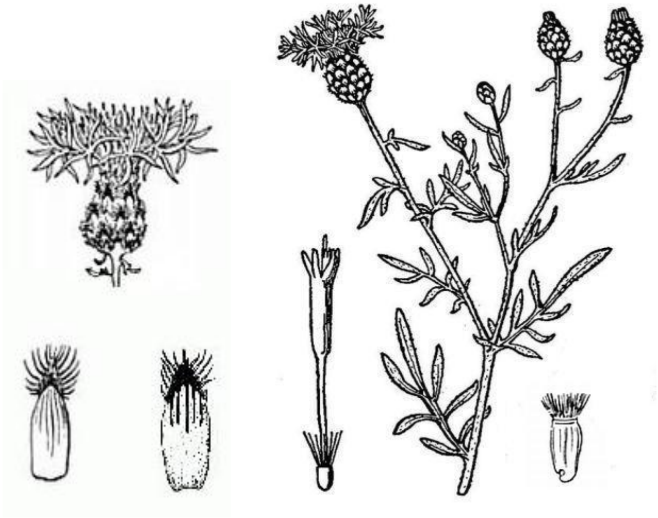
The hybrids grow taller than diffuse knapweed and tend to be short-lived perennials. The native parental plants in Europe can hybridize (interbreed) because there they have the same number of chromosomes (2n). In North America, crossings occur among *Centaurea ×psammogena* plants, and with typical *Centaurea diffusa*, which generally is rarer than the hybrids. So what has been thought of as the variability within diffuse knapweed here is really instead these masquerading hybrid knapweeds.



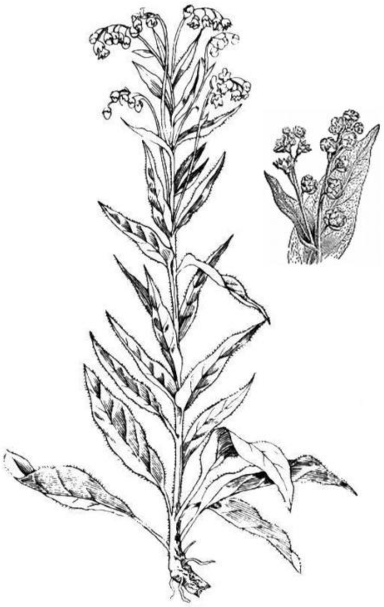


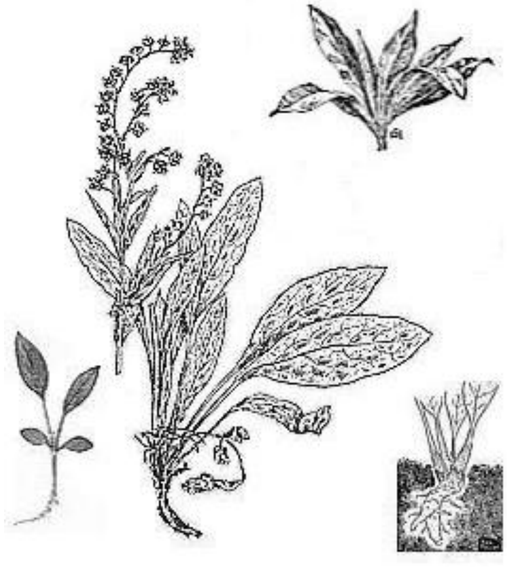
The **spotted knapweed** introduced to North America (*Centaurea stoebe* subsp. *micranthos*) has twice as many chromosomes (4n), a genetic barrier resulting in reproductive isolation from the varied 2n plants here. This spotted knapweed is a perennial that can live nearly a decade, with a taproot and sometimes short shallow lateral rootstocks. Rosette leaves and new stems appear at or near the base of the previous year's growth. Plants grow ½ to 3-4 feet high, with open branching and resin-dotted leaves. The thistle-like flowerheads produced in spring through fall are larger than in diffuse knapweed, and each has only purple (but rarely only white) flowers. Each bract has a blackish large triangular spot toward the tip, and no terminal spine; the bract's upper portion has a comb-like stiff fringe on each side. The seeds typically have a bristly tuft at one end. The plants do not become tumbleweeds.

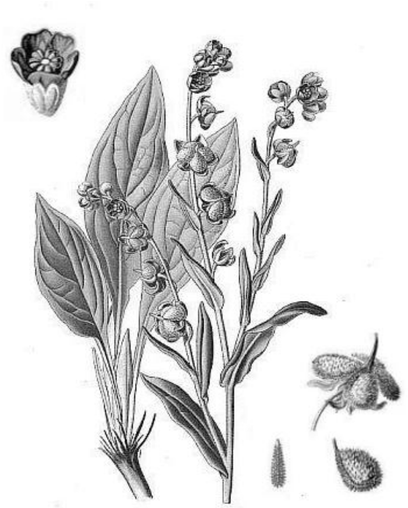
Houndstongue (*Cynoglossum officinale*) ❾ B

Forget-Me-Not Family (Boraginaceae) ❀

Sometimes called gypsy-flower, these plants appear to do best in disturbed open areas of high moisture. Their Velcro-like barbed fruits are a nuisance to people and animals. When consumed in hay, the plant's poisonous (☠) alkaloids can lead to permanent liver damage and photosensitization in horses and cattle, and the plants can cause dermatitis in people.







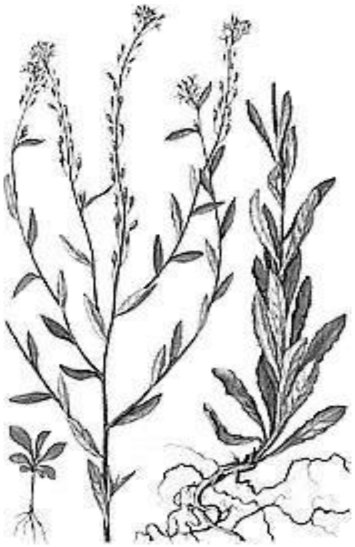
Houndstongue is a biennial (or sometimes short-lived perennial) with a thick woody black taproot, and reproduces only by seeds. Plants germinate in summer/fall, and over-winter as low rosettes. The hairy rough leaves are light green, conspicuously veined, and 4-12 inches long with smooth edges. Houndstongue plants bolt in the second spring, sending up stout stalks 1-4 feet high, and branch only at the top where they produce reddish purple flowers in mid-summer, and seeds by fall. The large fruits are dispersed as prickly nutlets, attaching to animals and clothing. Seed longevity in the soil is probably quite limited, but seeds may remain viable for 2-3 years on the old stalk or if the nutlet snags on something lasting in dispersal.

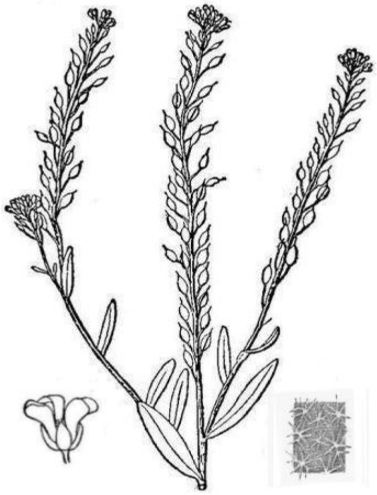
Hoary Alyssum (*Berteroa incana*) ❷

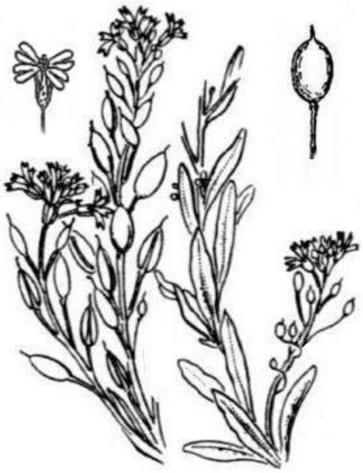
Mustard Family (Brassicaceae or Cruciferae) ✤

Hoary alyssum is occasionally called hoary false-madwort, or the more accurate hoary false-alyssum. It is continuing to advance across much of this country, and becoming common in some areas of Larimer County — particularly in the Estes Valley and farther north in the Red Feather Lakes area. The species is not on Colorado's official noxious weed list, but in 2011 was added to the Larimer County noxious weed list.

Hoary alyssum is toxic (☠) to horses, leading to diarrhea and lameness, and can cause abortion. As a contaminant in alfalfa hay, the weed can remain toxic for months. A diet of hay containing considerable hoary alyssum has caused the death of horses.







The species is an annual, biennial, or short-lived perennial found along roadsides and in disturbed areas of range and pasture. Plants grow 1-3 feet high, with rosette leaves at the base which are 2-3 inches long and lance-shaped with nearly smooth margins, and smaller upward-pointing leaves alternating along the several erect stems and their open upright branches. The foliage and stems are grayish green with many tiny mostly star-shaped hairs. Flowering occurs from spring through summer into fall. The small white flowers are in tight clusters near the stem top, each flower with four deeply notched petals. The hairy oblong or oval fruits are flask-like, with a small beak. Seeds in the soil can remain dormant but viable for 9 years.

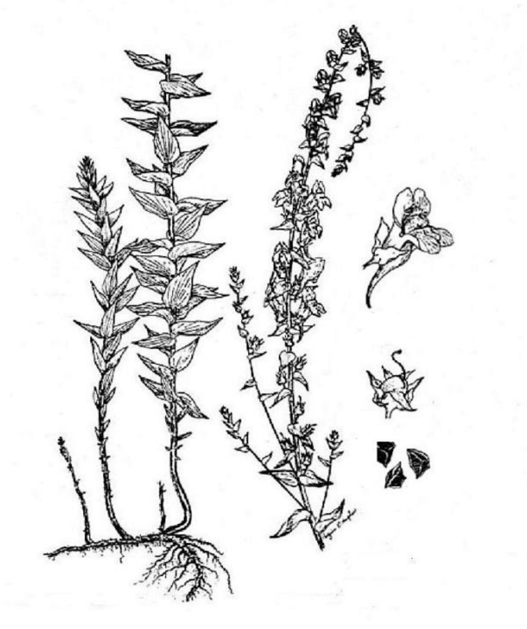
Dalmatian Toadflax (*Linaria dalmatica*) ❺ **B**

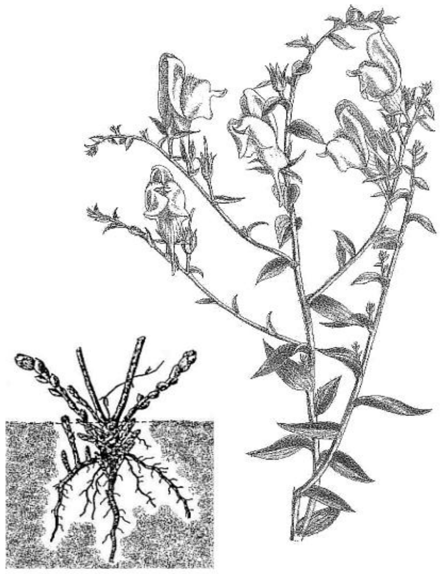
Yellow Toadflax (*Linaria vulgaris*) ❼ **B**

Snapdragon Tribe of Speedwell Family (Plantaginaceae) (formerly in Scrophulariaceae) ❀

Dalmatian toadflax, sometimes and better called **broadleaf toadflax**, is a short-lived perennial, which reproduces by shallow creeping rootstalks that can reach 10 feet in length, and seeds that can remain viable in the soil for a decade. This invader is frequently known as *Linaria genistifolia* subsp. *dalmatica*, being considered one of the subspecies of a complex species in Eurasia. The scientific understanding of the plants is unsettled where they are native. Also, current research suggests that two or three related entities were introduced in the United States and are being lumped together as “*Linaria dalmatica*”. (One has been called *Linaria dalmatica* subsp. *macedonica*.) Plants in this region occur mainly on drier rocky sites in the foothills, with more moisture in spring than summer.

Yellow toadflax generally occurs at higher elevations, in habitats with more summer moisture and more fertile deeper soils, such as gullies, stream banks and mountain meadows. Dalmatian toadflax is more typically upslope and in disturbed areas than yellow toadflax, and less likely to invade undisturbed habitats. In California, Idaho and Montana in some places where these weedy species have been found together, spontaneous fertile hybrids occur, which might be like the natural hybrids (*Linaria ×hybrida*) found in Europe. The leaves of the hybrids here are distinctly narrower than the wide leaves of typical Dalmatian toadflax.

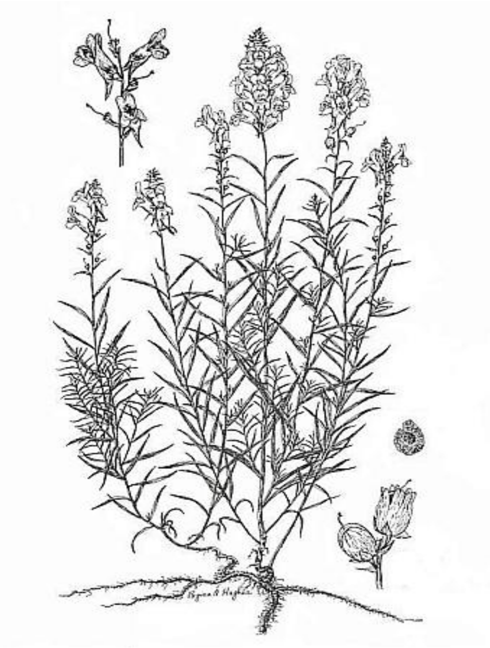


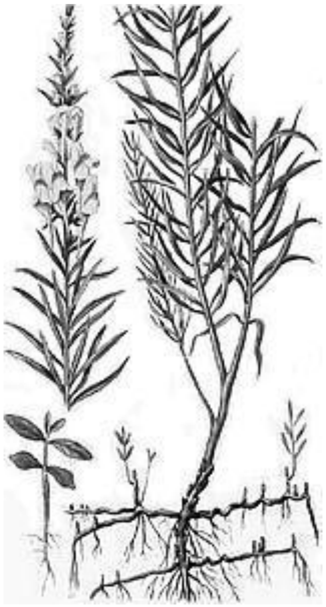


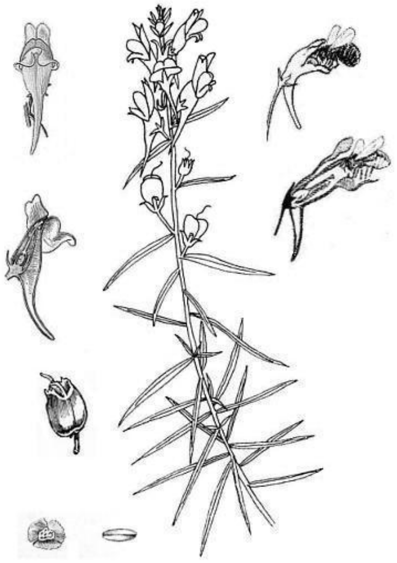
Dalmatian toadflax produces usually many stout stems from the base, and grows 2-4 feet high. The heart-shaped or oval leaves are bluish green and waxy, alternating and clasping the stem. Flowers are produced throughout the summer, dispersed along the loosely few-branched upper stem. They are bright yellow or paler and with a similarly yellow to darker or orangish throat patch, and have a long descending spur. The tiny pyramid-like seeds are not winged. By late fall the upright stems have dried out, and the plant over-winters as a loose rosette of evergreen short stems along the ground.

Yellow toadflax (❼), often called butter-and-eggs because its flowers are notably two-toned, is a perennial and reproduces from seeds (which can stay dormant in the soil for 8 years) and long shallow creeping rootstalks, which can produce dozens of secondary shoots each year.

The moister habitat preferences of yellow toadflax are discussed above with Dalmatian toadflax. Vigorous weedy hybrids between the two have been found west of Colorado, and might occur here. Their leaves are long but wider than the quite narrow leaves of typical yellow toadflax, and the seeds are pyramidal and winged. In Europe natural hybrids that may be similar are called *Linaria* ×*hybrida*.





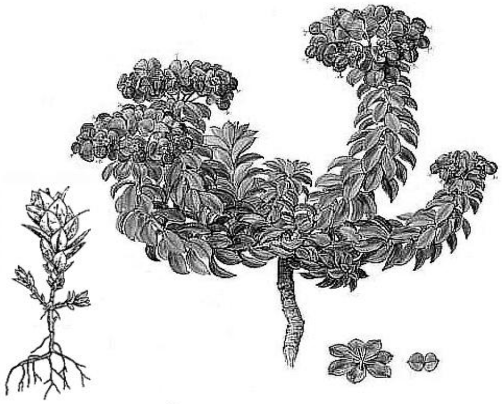


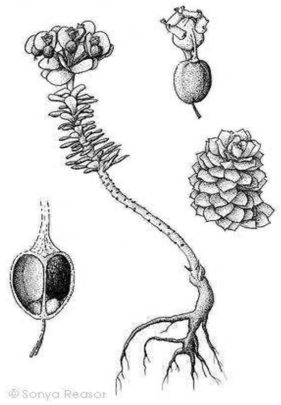
Yellow toadflax is generally smaller than Dalmatian toadflax. Plants grow nearly 1-3 feet high, having several erect and sometimes sparingly branched stems. The alternating leaves are narrow, and pale green with a silvery tinge. The flowers of yellow toadflax are densely clustered toward the top of the unbranched upper stem. They are smaller than the flowers of Dalmatian toadflax, and typically paler yellow to whitish and with a more contrastingly bright yellowish to orangish throat patch. The tiny disk-like seeds have a surrounding marginal wing. The plants over-winter as sprawling mats.

Myrtle Spurge (*Euphorbia myrsinites*) ❽ A

Rubber-Tree Family (Euphorbiaceae)

Myrtle spurge, sometimes called donkeytail spurge or creeping spurge, has a “simple perennial” life cycle — the species is a taprooted perennial that naturally reproduces only by seeds. When ripe they are projected from the fruit capsule even up to several yards, and can remain viable in the soil for 8 years. This Eurasian species was sold in the state as a garden ornamental until placed on the prohibited sales list in 2003 by the Colorado Department of Agriculture. It is a distinctive drought-hardy plant, but has escaped and become an invasive problem in the foothills and designated natural areas.





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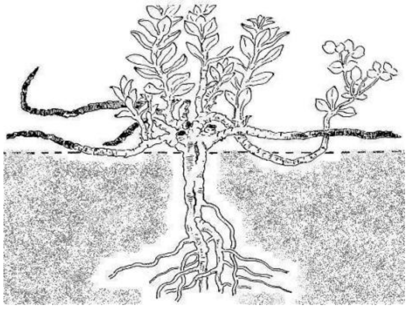
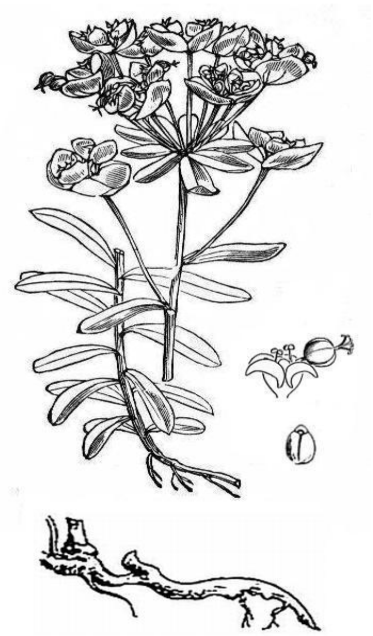


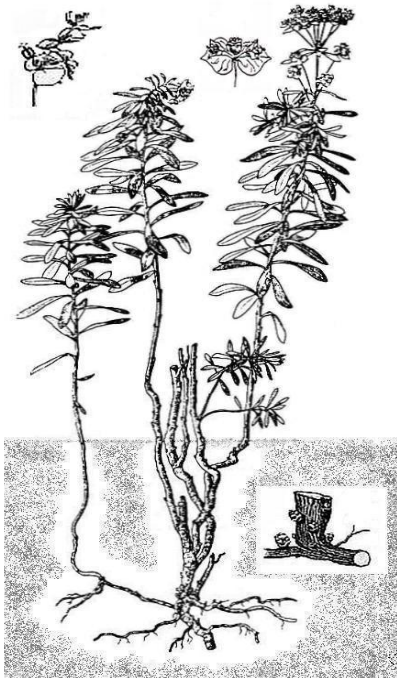
Myrtle spurge has a low growth form (4-12 inches in height). From its stout central taproot radiate ropy sprawling to ascending stems, which have an alternately arranged close spiral of broad, waxy bluish-green (to grayish- green) fleshy leaves. Caustic latex sap is present throughout the roots, stems and leaves, which may cause a skin rash or permanent damage in contact with the eye; also toxic (☠) if ingested. Flowering occurs on second-year stems in the spring. The apparent flowers are clustered at the stem’s tip in a somewhat tight array, each with a pair of showy yellowish green bracts cupping the small yellow flowers.

Leafy Spurge (*Euphorbia esula*) ⑩ B

Rubber-Tree Family (Euphorbiaceae)

Leafy spurge infests millions of acres in North Dakota, Montana and Wyoming and elsewhere in the United States. It is the worst noxious weed problem in Fort Collins and much of Larimer County.





Leafy spurge is a deep-rooted perennial that reproduces from budding roots and rootstalks and by seeds. Roots can reach depths of 26 feet, and the rootstalks spread 15 feet in a year. Seeds can remain viable in the soil for 8 years. Plants emerge in early spring, have hairless pale-green to blue-green stems and grow to 1-3 feet high, with alternating narrow leaves 1-2 inches long. The entire plant contains caustic milky sap, easily seen by tearing a leaf or breaking a stem. This very caustic latex sap may cause a skin rash, or permanent damage in contact with the eye, and also can be poisonous (☠) to horses, cattle, deer and elk. In spring flower-clusters begin to emerge, first as pairs of heart-shaped yellowish green bracts, which cup the developing small greenish yellow flowers. Mature seeds are expelled out of the bursting fruit capsule, sent flying inches to feet or even several yards away.

Cheatgrass ❹

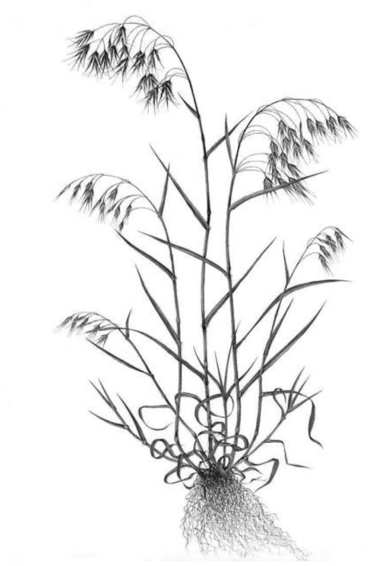
Downy Brome (*Bromus tectorum*) (C) and Japanese Brome (*Bromus japonicus*)

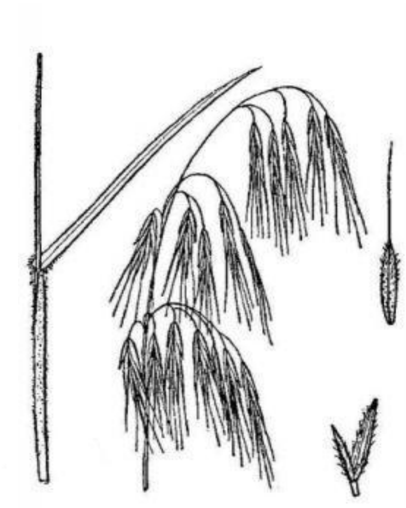
Grass Family (Poaceae or Gramineae)

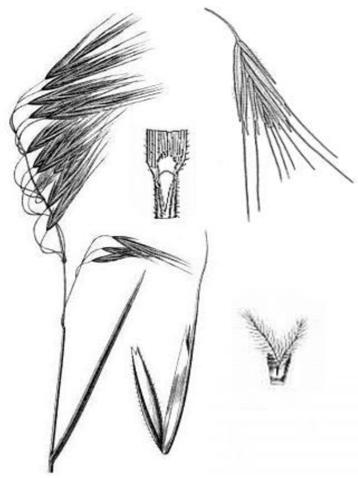
“Cheatgrass” is generally a collective name here for winter-annual brome grass species, which germinate in fall, are semi-dormant through winter, take advantage of late winter and early spring moisture to grow fast, and produce seeds and die before the drier summer. For most of Colorado cheatgrass means downy brome, to a lesser extent the similar Japanese brome. They can occur together, with Japanese brome tending to favor the moister sites.

An established seedling may produce a cluster of 1 to 20 secondary stems. Through winter the young plants go into a semi-dormant state above ground, but their extensive fibrous roots continue to grow and spread. In early spring these head-started plants are among the first to green up. The already densely growing cheatgrass depletes soil moisture throughout spring, which can even prevent native plant seedlings from establishing, and depress the moisture status of mature shrubs. At cheatgrass maturity, the abundant sharp-pointed fruits become a problem to livestock, as well as a nuisance to pets and hikers. The dense summer stands of dried-out, thin dead stems are a serious wildfire hazard.

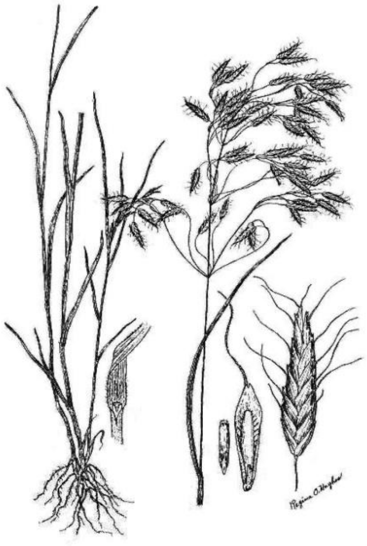
Cheatgrass finishes its annual life cycle with seed set by early to mid-summer. Downy brome produces an abundance of seeds, which are dispersed readily and typically germinate fairly soon thereafter, from late summer into fall. A small proportion may germinate in spring. Seeds however can survive in the soil for 1-3 (even 5) years, and remain viable in stored straw for over a decade.

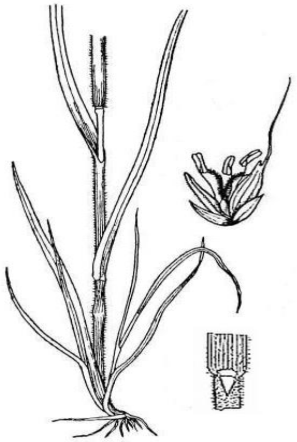






Beginning with the greening seedlings, the leaves are softly hairy. In late spring to early summer the head-started **downy brome** stems quickly grow 4-24 (-30) inches high and produce flowering stalks, gracefully arched and drooping, with nodding to hanging downy wedge-shaped spikelets (broader toward tip). A spikelet has (1-) 5 to 8 reduced flowers (florets), each with a long straight bristle-like projecting point. The spikelet easily breaks apart in dispersing the sharp-pointed one-seeded fruits. As the plants mature, set seed and finish their life cycle, they characteristically turn purplish (or russet), then yellowish tan.





Japanese brome tends to be taller, growing 8-48 inches high. The narrow spikelets are broader toward the base or oblong and have 6 to 14 florets, each with a shorter somewhat twisted bristle-like projecting point. Seeds of Japanese brome generally are held longer on the dried-out dead plants, dispersing from fall through winter and early spring, but then are dormant until late summer or early fall, when they germinate (as downy brome is then doing).

Sources for Plant Identification and Management

- Larimer County's Weed District — www.larimer.org/weeds
- Boulder County's Weed Management Program — www.bouldercounty.org/live/environment/land/pages/weeds.aspx
- Colorado Department of Agriculture's Noxious Weed Program — www.colorado.gov/ag/weeds
- Colorado State University Extension's Small Acreage Management — www.ext.colostate.edu/sam
- Colorado Weed Management Association — www.cwma.org
- Estes Land Stewardship Association (ELSA) — www.elsainfo.org
  Telephone 970-498-5768 **Note:** This ID booklet (v1.0) can be downloaded there.

Plant and Weed Identification:

- Ernie Marx's website — www.EasternColoradoWildflowers.com
- Al Schneider's website — www.SWColoradoWildflowers.com/index.htm
- Colorado Native Plant Society — www.conps.org
- ***Weeds of Colorado***, Revised Edition, by R.L. Zimdahl (1998), 222 pages.
- ***Weeds of the West***, 9th Revised Ed., by T.D. Whitson and others (2006), 628 pages.
- ***Weeds of California and Other Western States***, by J.M. DiTomaso & E.A. Healey (2007), Two Volumes, 1808 pages.
- ***Aquatic and Riparian Weeds of the West***, by J.M. DiTomaso & E.A. Healey (2003), 442 pages.

Poisonous Plants:

- ***A Guide to Plant Poisoning of Animals in North America***
  by A.P. Knight & R.G. Walter (2001), 367 pages.
- Dr. Knight's website — http://southcampus.colostate.edu/poisonous_plants
  or when necessary email Dr. Knight: Anthony.Knight@colostate.edu

Colorado Weed Law; and Herbicide Use Requirements and Information

- ✓ Government of Colorado Noxious Weed Act — http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1176829181225
- ⓘ Crop Data Management Systems — www.cdms.net/LabelsMSDS/LMdefault.aspx
  for Herbicide labels and MSDS (material safety data sheet) information
- ⓘ Pesticide Information Center — http://npic.orst.edu/
  Telephone 1-800-858-7378, for Information on pesticides toxicity,
  a herbicide's environmental impact, and its biological mode of action
- ⓘ Colorado Environmental Pesticide Education Program — www.colostate.edu/Depts/SoilCrop/extension/CEPEP

Poison and Herbicide Safety Responders

- Rocky Mountain Poison & Drug Center — www.rmpdc.org/
  Telephone 1-800-222-1222
- CHEMTREC — http://chemtrec.com/
  Telephone 1-800-424-9300, for Help with chemical spills